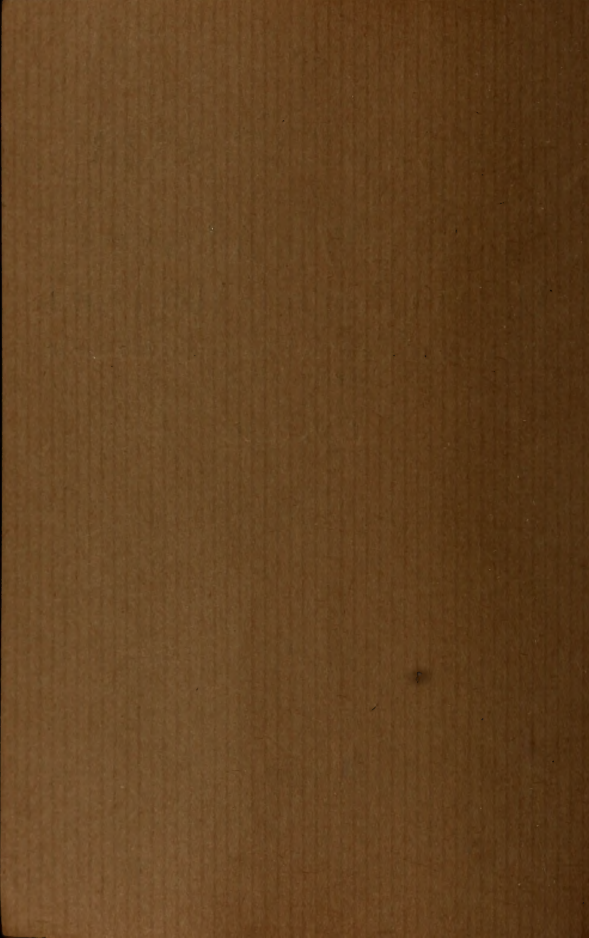


**LITTLE BLUE BOOK NO. 1328**  
**Edited by E. Haldeman-Julius**

# **Huxley: Who Advanced Human Progress 100 Years**

**The Story of the Man Who Fought the Battle  
for Evolution**

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HALDEMAN-JULIUS PUBLICATIONS  
GIRARD, KANSAS

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## HUXLEY: WHO ADVANCED HUMAN PROGRESS 100 YEARS

### THE STORY OF THE MAN WHO FOUGHT THE BATTLE FOR EVOLUTION

In these days, when so many of our leading scientists are apologetic and compromising, the world cries for another Huxley. It is a fighting scientist of the first rank that is needed to scatter the forces of obscurantism and ignorance which, emboldened by the timidity of contemporary spokesmen of science, are waging a formidable campaign to throttle scientific freedom, both in and out of the public schools. A single Huxley would be a profitable exchange for the whole tribe of apologists and self-styled reconcilers who are putting science more and more upon the defensive.

Huxley's public career of over forty years was marked by an uncompromising warfare against intolerance and superstition and a courageous championship of the rights of free thought and intellectual liberty in every field. He possessed a positive genius for debunking sham. The daring resolution and self-forgetful modesty of the man are nowhere better illustrated than in the terse declaration of purpose which he committed to his diary at the beginning of his life-work:

*"To smite all humbugs, however big; to give a nobler tone to sciences; to set an example of*



*abstinence from petty personal controversies and of toleration for everything but lying; to be indifferent as to whether the work is recognized as mine or not, so long as it is done."*

In the same spirit he declared his faith in scientific democracy: "I believe in bringing the results of scientific investigation to the common people. I want the working classes to understand that science has great facts for them."

These are not the words of a mere popular lecturer. Huxley, following the death of Darwin, was by universal agreement the greatest of all English-speaking scientists; the science of Biology was practically his own creation; he was honored by Oxford University, and his career was crowned by the highest distinctions that a British scientist can receive: the presidency of the British Association for the Advancement of Science, and of the Royal Society.

Huxley not only believed in the common people—he acted upon his faith. He organized workingmen's institutes, labor colleges, summer schools, and courses of evening lectures for workers. The result was that scientific knowledge spread among the common people in England with an amazing rapidity. He accepted the challenge of organized bigotry, in its first furious reaction against Evolution; he met it on its own ground, and by the brilliancy and skill of his intellectual generalship, routed it in confusion from the field. The victory for Evolution was won in England half a century ago, and that country never suffered the disgrace of a Tennessee monkey trial.

The conversion of England to Evolution in so short a time advanced the world's scientific progress by at least one hundred years. It was the greatest and most far-reaching contest ever won by science. A century after the death of Copernicus, the earth was still generally believed, by educated people, to be the center of the universe and stationary. The year 1929 marks only the seventieth anniversary of the publication of Darwin's *Origin of Species*, and Evolution today, as it long has been, is the very basis of all scientific education and research. Yet the doctrine of Evolution is far more anti-Biblical than was the Copernican astronomy in its day. There was no Huxley in the sixteenth and seventeenth centuries.

Had there not been a Huxley to fight the battle for scientific freedom in the nineteenth century, it is doubtful if Evolution in its infancy could have survived the onslaughts of the entrenched religious forces of the day. The new truth might have been strangled in its cradle. At least, its victory would likely have been postponed for generations.

That Huxley could achieve so extraordinary a triumph almost single-handed may seem incredible until one forms a first-hand acquaintance with the man, through a study of his personal history and an analysis of the fascinating combination of physical and mental characteristics which entered into his personality.

The year 1925 marked the centennial of Huxley's birth, for this greatest of all "fighters for freedom" in the intellectual liberation war

of humanity was born May 4, 1825, in the little town of Ealing, near London. His father was senior master in the school there conducted by Dr. Nicholas, where Cardinal Newman had been a pupil as a child.

"Why I was christened Thomas Henry," said Huxley in later years, with a touch of humor, "I do not know; but it is a curious chance that my parents should have fixed for my usual denomination upon the name of that particular Apostle [the one who wanted to be *shown* before he believed] with whom I have always felt most sympathy."

We know little of the Huxleys except that they were an old Anglo-Saxon family. Thomas was the seventh and youngest child. Of his early education he tells us: "My regular school training was of the briefest, perhaps fortunately, for though my way of life has made me acquainted with all sorts and conditions of men, from the highest to the lowest, I deliberately affirm that the society I fell into at school was the worst I have ever known. We boys were average lads, with much the same inherent capacity for good and evil as any others; but the people who were set over us cared about as much for our intellectual and moral welfare as if they were baby-farmers. We were left to the operation of the struggle for existence among ourselves, and bullying was the least of the ill practices current among us. Almost the only cheerful reminiscence in connection with the place which arises in my mind is that of a battle I had with one of my classmates, who had



bullied me until I could stand it no longer. I was a very slight lad, but there was a wild-cat element in me which, when roused, made up for lack of weight, and I licked my adversary effectually. However, one of my first experiences of the extremely rough-and-ready nature of justice, as exhibited by the course of things in general, arose out of the fact that I—the victor—had a black eye, while he—the vanquished—had none, so that I got into disgrace and he did not. We made it up, and thereafter I was unmolested. One of the greatest shocks I ever received in my life was to be told a dozen years afterwards by the groom who brought me my horse in a stable-yard in Sydney that he was my quondam antagonist." It turned out that the ex-bully had been convicted of crime and transported to the penal settlements in Australia.

In 1835, when Huxley was ten, Dr. Nicholas, the proprietor of the Ealing school, died, the institution was broken up, and the elder Huxley returned to his old home in Coventry, where he secured a position in a savings bank.

Huxley's schooling now ended, for the family was a large one, the parents' means scanty, and free public schools at that time did not exist. However, there were books at home; Thomas became an omnivorous reader and sharpened his naturally quick intellect by conversation with his elders. Even at this early age he began to devour scientific books. He also became interested in philosophy; but he had no taste for mere speculation—he wanted to get down to the bed-rock of truth and fact.

He learned Greek in order to study at first hand the ancient writers on science. For instance, he wished to check up the statement attributed to Aristotle that the heart has only three chambers. He did so, and found that the mistake was on the part of the translators and had never been corrected.

Two of Huxley's sisters had married doctors. This fact, combined with the lad's inherent interest in science, steered him toward the medical profession. In those days, doctors like lawyers could start out to learn the profession by becoming apprenticed to successful practitioners. Dr. Cooke, the husband of his elder sister, who was settled at Coventry, gave him lessons in the principles of medicine as early as June, 1840, when Huxley was only fifteen. In January, 1841, he went to Rotherhithe, as assistant to a Dr. Chandler, whose work was among the poor in the dock region of the East End of London.

"I saw strange things there—" Huxley related afterwards, "among the rest, people who came to me for medical aid, and who were really suffering from nothing but slow starvation. I have not forgotten—am not likely to forget so long as memory holds—a visit to a sick girl in a wretched garret where two or three other women, one a deformed woman, sister of my patient, were busy shirt-making. After due examination, even my small medical knowledge sufficed to show that my patient was merely in want of some better food than the bread and bad tea on which these people were living." Such were social conditions in

the great Christian city of London when the horrors of the new Industrial Era were at their worst. It was at about this time that Hood wrote his "Song of the Shirt," which did much to awaken the national conscience. In the midst of this frightful degradation of the masses the Church remained apathetic, orthodoxy held full sway, and at Oxford Newman and his friends were writing learned treatises about the Apostolical Succession.

It was at about this time that, during an autopsy at which he was assisting, to improve his knowledge of anatomy, Huxley had the misfortune to suffer an infection which resulted in blood-poisoning. While the infection did not prove fatal, it produced a permanent disturbance of his digestive system from which he suffered all his life. Like Darwin, he accomplished prodigious professional labors in the face of a chronic semi-invalidism.

But Huxley really cared little for medicine merely as the art of healing. "My great desire," he informs us, "was to be a mechanical engineer, but the fates were against this. . . . The only part of my professional course which really and deeply interested me was physiology, which is the mechanical engineering of living machines; and, notwithstanding that natural science has been my proper business, I am afraid there is very little of the genuine naturalist in me. I never collected anything . . . ; what I cared for was the architectural and engineering part of the business, the working out of the wonderful unity of plan in the thousands and thousands of diverse living con-

structions, and the modifications of similar apparatuses to serve diverse ends."

Huxley's inquisitive instinct was evident at an early age. Many a youngster has looked with wonder at the gorgeous colors of the sunset, but Huxley tried to find out why the colors were there. For a time, too, he was fascinated by that scientific will o' the wisp—perpetual motion. He struggled with the problem and at last thought he had invented a sure enough machine that would go. He took it to the great Faraday, who in a kindly way pointed out to the young enthusiast that if perpetual motion were possible "it would have occurred spontaneously in nature, and would have overpowered all the other forces."

No doubt it was Huxley's work among the poor at Rotherhithe in those early days that planted in him the germ of his interest in the working classes, an interest which was to bear glorious fruit in later years.

Leaving Rotherhithe, young Huxley became an apprentice with another medical brother-in-law, Dr. J. G. Scott, the husband of his sister Lizzie. Dr. Scott practiced in North London. This location made it convenient for Huxley to attend lectures at Sydenham College, where he achieved a brilliant success. He won the silver medal in botany awarded by the Apothecaries' Society. This, his first scientific recognition, gave him more pleasure than any of the greater rewards that were still to come.

About this time he ran across Carlyle. "To make things clear and get rid of cant and

shows of all sorts. This was the lesson I learnt from Carlyle's books when I was a boy, and it has stuck by me all my life."

On October 1, 1842, at seventeen, with his brother James he became what we would now call an interne, at Charing Cross hospital. Some time earlier he had acquired a microscope, with which he busied himself in his spare time. Passers-by in the street often looked up at the figure of the youth bending over his microscope in the window of his humble chamber. With this microscope he made his first scientific discovery, described in a paper entitled "On a Hitherto Undescribed Structure in the Human Hair-Sheath." It appeared in the *London Medical Gazette* for July, 1845. The structure is still called "Huxley's layer."

Meanwhile he was pursuing studies leading to a medical degree at London University. He won a first prize in chemistry and a gold medal in anatomy and physiology. He took his degree at twenty.

In those days many of the great authorities in science, especially anatomy, were unavailable in English. So Huxley mastered German, French, and Italian, in order to keep up with the latest research. He introduced the practice of supplying full bibliographical references, in scientific books and papers, to the contemporaneous authorities on the subject throughout the world.

It is a curious coincidence that the foundation of Huxley's international fame in the realm



of biological science was precisely the same as Darwin's fifteen years earlier—a voyage of several years' duration on a government vessel among the islands of the southern hemisphere. Hooker, subsequently a close friend of both Darwin and Huxley, though overshadowed by them in scientific reputation, likewise began his career on shipboard.

On the advice of a fellow student, Huxley decided to apply for an appointment in the naval medical service. The application was successful; early in 1846 he was appointed to the *Victory*, Nelson's old flagship, for service at Haslar hospital. In October he was transferred to a frigate called the *Rattlesnake*, which was under orders to sail on a four years' cruise for the purpose of charting the waters of Australia and the East Indies.

The *Rattlesnake* weighed anchor at Spithead on December 3, 1846, and turned her prow seaward. Huxley's position was that of assistant naval surgeon. Virchow, the great German pathologist, in a memorial tribute to Huxley remarked:

When Huxley himself left Charing Cross hospital in 1846, he had enjoyed a rich measure of instruction in anatomy and physiology. Thus trained, he took the post of naval surgeon, and by the time he returned, four years later, he had become a perfect zoologist and a keen-sighted ethnologist. . . . For a young man who, besides collecting a rich treasure of positive knowledge, has practiced dissection and the exercise of a critical judgment, a long sea-voyage and a peaceful sojourn among entirely new surroundings afford an invaluable opportunity for original work and deep reflection. Freed from the formalism of the

schools, thrown upon the use of his own intellect, compelled to test each single object as regards properties and history, he soon forgets the dogmas of the prevailing system and becomes, first a skeptic, and then an investigator.

The *Rattlesnake* was a war vessel of the old 28-gun type, under the command of Capt. Owen Stanley. Her crew consisted of 180 officers and men, and she was accompanied by two light vessels, the *Bramble* and the *Castlereagh*, for scouting purposes.

Huxley soon made himself at home in the new environment on shipboard. "It was good for me," he writes, "to live under sharp discipline; to be down on the realities of existence by living on bare necessities; to find out how extremely well worth living life seemed to be when one woke up from a night's rest on a soft plank with the sky for canopy, and cocoa and weevilly biscuit the sole prospect for breakfast; and more especially to work for the sake of what I got for myself out of it, even if it all went to the bottom and myself along with it. My brother officers were as good fellows as sailors ought to be, and generally are, but naturally they neither knew nor cared anything about my pursuits. . . ."

Huxley's study of natural history during the cruise was his own private affair, his position being that of naval surgeon, or ship's doctor, in which capacity he probably had little to do. There was a professional naturalist attached to the expedition in the person of one John McGillivray, a man of mediocre ability whose name has long since sunk into oblivion.

We cannot stop to follow in detail the course of that four-year cruise amid the tropic seas of the southern hemisphere. Proceeding by way of Madeira and Rio de Janeiro in South America, the *Rattlesnake* pursued a leisurely course toward Australia. She tied up at Sydney on July 16. Here there was much survey work to be done and Huxley remained in and about this town for three months. In fact, he made several very prolonged stays in Sydney during the course of the cruise, made many acquaintances there, and, as we are told and may easily believe, "became a general favorite."

It was in Sydney that he first met and won the love of the girl who was destined later to become Mrs. Huxley. Her name was Henrietta A. Heathorn. More of her anon.

In the waters round Torres Strait, between New Guinea and northern Australia, Huxley found himself in a natural history paradise. Vast colonies of coral building organisms filled the shallow waters of the tropic sea. "At low tide," says Mitchell, "the most wonderful fields of the animal flowers of the sea are exposed. Some of them form branching systems of hard skeletons like stony trees, the soft, brightly colored animals dotted over the stems like buds. Others form solid masses; others, again, rounded skull-like boulders, or elevations like toadstools. The colors of the skeletons and the animals are vivid scarlets and purples and greens. Sea-anemones, shell-fish, and star-fish of the most vivid hues are as abundant as the corals. Brilliant fish dart through the blue

soms of the marine gardens, and sea-birds scream and wheel in the air."

The voyage was for Huxley "a four years' course in the great university of Nature." Every day, in his tiny, stuffy cabin he labored over the dissection of different forms of animal life brought to the surface by his tow-net, his microscope lashed to a mast because of the pitching of the vessel. He made careful drawings of the various structures that he dissected and filled a large portfolio with them. At Sydney, too, he had access to libraries and museums where he could check up on his field work.

During the voyage, Huxley sent many papers to the Linnaean Society, a scientific body in England, but apparently they were disregarded. Far from being discouraged, he aimed higher and forwarded a carefully prepared paper to the Royal Society, the most illustrious scientific association in the kingdom, of which Sir Isaac Newton was once President. Owing to the movements of the ship he was unable to learn of the fate of this paper until his return home the following year, when, to his amazement and delight, he found that it had been accepted and published and that a package of copies awaited him. The title of this paper was "On the Anatomy and the Affinities of the Family of Medusae." For this investigation he subsequently received the gold medal of the Society.

The reason for the extraordinary recognition that this work received was that Huxley had established a new method of biological research

—that of comparative anatomy. This he had applied to his study of the Medusae. The latter is the scientific name of a large and interesting family of invertebrates, popularly known as the jelly-fishes. Huxley was a pioneer in invertebrate anatomy.

But Huxley's pathway to an assured position in life was not one of roses. When the *Rattlesnake* was paid off at Chatham on November 9, 1850, Huxley, who was now twenty-five years old, could not endure the thought of rusting away as an obscure naval officer. The scientific data which he had assembled was enough to keep him busy for years. Unfortunately, he was—unlike Darwin—without independent means. He cast about for an assignment in the service that would permit him to remain in England and pursue his scientific work. Through the influence of friends, he secured an appointment on the slender stipend of which he managed to live for three years while pushing on with his biological labors. But the Admiralty, despite the solicitations of Huxley's friends, refused to extend any financial help in the publication of his papers. Then his assignment ashore was suddenly revoked. As Huxley himself expressed it: "The Admiralty, getting tired, I suppose, cut short the discussion by ordering me to join a ship, which thing I declined to do. . . ." So he found himself out of the navy for good.

This was a hazardous decision to make, for it left Huxley practically stranded in London. He managed to eke out a living by writing reviews and popular scientific articles for the



magazines, translating foreign books, and lecturing. He wrote a regular column on "Contemporary Science" for the *Westminster Review*. But he was in such straits at one time he had to pawn his gold medal. He made numerous applications for professorships of physiology and of comparative anatomy, but was turned down again and again. As he even applied for a position at the University of Toronto, in Canada, his desperation may be imagined. But, "fortunately, as it turned out," he wrote in after life, this institution "would not look at" either himself or Tyndall, who was also an applicant.

When his outlook seemed gloomiest, Huxley wrote to Miss Heathorn: "However painful our separation may be, the spectacle of a man who had given up the cherished purpose of his life . . . would before long years were over our heads, be infinitely more painful." Miss Heathorn nobly encouraged him in his determination to win his way in science; she would patiently wait until he could afford to marry her. Thus encouraged, Huxley, although he had for a time entertained the idea of emigrating to Australia\*, determined to stay in London and fight out his battle. "My course of life

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\*This suggests a curious parallel in the early life of Herbert Spencer, who was undecided whether to remain in England or emigrate to New Zealand. In his methodical way he put down in separate columns the arguments for and the arguments against emigrating, with a numerical value attached to each reason. Adding up the columns, he found the figures heavily in favor of New Zealand. He calmly remained in England.

is taken," he wrote at the time, "I will not leave London—I *will* make myself a name and a position as well as an income by some kind of pursuit connected with science, which is the thing for which Nature has fitted me if she has ever fitted anyone for anything."

He had staunch friends who believed in him and stood by him. A man of wealth even offered him a pension of \$2000 a year, but his pride and independence prevented his acceptance of the generous offer. There was a rift in the clouds when in 1854 the Royal Society was enabled to extend to him a small government grant of money for the publication of his papers, which a technicality prevented its doing while he was on the Navy payroll. In the same year he received an offer of a permanent lectureship at the Government School of Mines, together with an appointment as naturalist to the Geological Survey. Other opportunities to earn money also came his way, as they do when one finally gets a "break." The following year he became professor of physiology at the Royal Institution.

After the turning point came, and his future began to look assured, Huxley remarked in a letter to his sister: "There is always a Cape Horn in one's life that one either weathers or wrecks one's self on. Thank God, I think I may say I have weathered mine—not without a good deal of damage to spars and rigging though, for it blew deuced hard on the other side."

On July 21, 1855, when Huxley was thirty,

the wedding bells rang to celebrate his marriage to his old sweetheart, Miss Heathorn, whom he had met in Australia eight years before.

Meanwhile, Huxley was building up the modern science of biology. He showed that the substance called protoplasm is the stuff out of which all life is made, and that the protoplasm of animals is identical with that of plants, plants being really "animals confined in wooden cases."

Huxley's life after his return to England may be divided into three periods. From 1850 to 1860 he was engaged in carving out his great scientific career in biology through fundamental researches in the lower forms of animal life and fossil structures. From 1860 to 1870 he was absorbed in correlating his own work with the concept of Evolution, which Darwin had given to the world in 1859 when he published *The Origin of Species*, and in defending Evolution against the furious assaults of superstition and intolerance. After 1870, when he had become the greatest living biologist, he devoted himself to important educational work, with arduous official duties on government boards, and to harvesting the results of his lifework.

This brings us to the great subject of Evolution, of which Huxley was destined to become the foremost champion. In 1859 Darwin, as we have noticed, published *The Origin of Species*. Although the idea of evolution had for long been vaguely floating in the air, hardly

anyone took it seriously. Darwin was the first to provide a solid basis of correlated facts to support it, and to put forward a reasonable hypothesis to explain its operation. "He brought together," as Mitchell points out, "not only proofs of the actual operation of natural selection, but a body of evidence in favor of the fact of evolution that was, beyond all comparison, more striking than had been adduced by any earlier philosophical or biological writer."

However much it may be necessary to modify the factor of natural selection as the agency by which Evolution has mainly operated, of the fact of Evolution itself there has never been any doubt in the minds of the world's responsible scientists since the time of Darwin and Huxley.

Huxley, indeed, had been himself slowly reaching the conception "of the whole world of life, past and present, as a single family tree growing up from the simplest possible roots, and gradually spreading into two main branches of animals and plants, and then into the endless series of complicated ramifications that make up the living and extinct animals and plants." He was "piecing together the scattered fragments, and gradually learning to see here and there whole branches, as yet separate at their lower ends, but in themselves shapely, and showing a general resemblance to one another in the gradual progression from simple to complex."

So it was that Huxley's own researches prepared him to recognize the importance of Dar-

win's discovery. "He was like an engineer, boring a tunnel through a mountain but ignorant of how near he was to the pleasant valley on the other side; and above all, ignorant how rapidly he was being met by a much more mighty excavation from the other side." Darwin got there first, for he was sixteen years older than Huxley and had had a long start on him. Darwin was already acquainted with the work of Huxley and had a high regard for him.

Writing to his co-worker Wallace, when the reception of the *Origin* was still a matter of doubt, Darwin said: "I think I told you before that Hooker is a complete convert. If I can convert Huxley, I shall be content." When he received the news of Huxley's complete and enthusiastic support, Darwin was so overjoyed that he penned the following lines to him:

Like a good Catholic who has received extreme unction, I can now sing *Nunc Dimittis*. I should have been more than contented with one-quarter of what you have said. Exactly fifteen months ago, when I first put pen to paper for this volume, I had awful misgivings, and thought perhaps I had deluded myself, like so many have done; and I then fixed in my mind three judges, on whose decision I determined mentally to abide. The judges were Lyell, Hooker, and yourself. It was this which made me so excessively anxious for your verdict. I am now contented, and can sing my *Nunc Dimittis*.\*

Speaking of the impression which *The Origin*

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\*The Song of Simeon. He means "Now I can die satisfied."



of *Species* made upon himself and his scientific contemporaries, Huxley later wrote that it "had the effect upon them of that of a flash of light which, which to a man who has lost himself in a dark night, suddenly reveals a road which, whether it takes him straight home or not, certainly goes his way. That which we were looking for and could not find, was a hypothesis respecting the origin of known organic forms, which assumed the operation of no causes but such as could be proved to be actually at work. . . . The *Origin* provided us with the working hypothesis we sought."

After a thorough study of the book, Huxley warmly accepted Darwin's conclusions and when the storm of opposition broke loose he took the field to defend him, Darwin's invalidism, age, and retiring disposition making controversy distasteful to him. While Huxley never had a moment's doubt of the truth of Evolution, he never carried his championship of natural selection to the point of fanaticism. He, like Darwin, regarded it only as the most probable cause of the phenomena of evolution, in the light of data at that time available—a cause which might be modified in the light of further facts. They would have had no quarrel with the Mutation theory, developed by DeVries and others, for natural selection would still be necessary to preserve the mutations when they appeared.

When *The Origin of Species* came before the public, Huxley by a happy circumstance was given an assignment to review it for the *London*

*Times*. He wrote a notable article, warmly recommending the book, but at the same time emphasizing the importance of intelligent belief and urging the necessity of caution before giving one's assent to any statement.

It was in 1860, the year after the publication of Darwin's world-shattering book, that Huxley had his famous encounter with the Bishop of Oxford, the Right Rev. Samuel Wilberforce, one of the most redoubtable ecclesiastics of his day, and popularly known throughout England as "Soapy Sam," because of his slippery arts as a religious politician and public man.

The Bishop and Huxley met in open debate at a meeting of the great British Association, in Oxford. The Bishop knew nothing about science, but had been "crammed to the muzzle," it is said, with "undigested and inaccurate information" supplied him by a second-rate scientist. Thus armed, he hoped to annihilate the enemy. One who was present described the scene as follows: "In a light, scoffing tone, florid and fluent, he assured us there was nothing in the idea of evolution; rock pigeons were what rock pigeons had always been. Then, turning to his antagonist with a smiling insolence, he begged to know, was it through his grandfather or his grandmother that he claimed his descent from a monkey?"

The Bishop's flippancy drew from Huxley a stinging rejoinder. The Bishop, by referring to Huxley's "grandmother," had slyly tried to smear Evolution with insult to and degradation of womanhood. Turning to a friend sitting

near, Huxley whispered, ironically, "The Lord hath delivered him into my hands!"

Huxley, in his reply, after exposing the Bishop's colossal ignorance of science, said in substance: "I asserted—and I repeat—that a man has no reason to be ashamed of having an ape for a grandfather. If there were an ancestor whom I should feel shame in recalling, it would be a man who prostituted the gifts of culture and eloquence to the service of prejudice and falsehood."

The Bishop was properly squelched and never repeated his disastrous performance.

"I am Darwin's bull-dog," Huxley once said of himself laughingly; and there was much truth in the sally.

Professor Mivart, a Catholic scholar, more subtle than the Protestant champions of the Bible, thought to execute a flank attack on Darwin and Huxley and surprise them in the rear, by claiming that a great Catholic theologian, the Jesuit Suarez, hundreds of years ago, had interpreted Genesis as meaning that life appeared by means of evolution. Huxley immediately repaired to a library, and dug out the formidable Latin tomes of Suarez. "Among these I dived," he writes with amusement, "to the great astonishment of the librarian." As a result of his researches, he proved that Suarez had expressly taught the orthodox six-day creation theory and condemned those who differed from it. "So I have come out," he chuckles, "in the new character of a defender

of Catholic orthodoxy, and upset Mivart out of the mouth of his own prophet."\*

One of Huxley's greatest contributions to science was his demonstration that all life is essentially one; "the difference between an animal and plant is one of degree rather than kind," and "the problem whether, in a given case, an organism is an animal or a plant may be essentially insoluble."

In lectures delivered at Edinburgh in 1862, "On the Relation of Man to the Lower Animals," Huxley asserted, with a wealth of evidence, the physical relationship between man and the apes. This brought down on him a storm of orthodox abuse, including such beautiful phrases as "foul outrage," "vilest and beastliest paradox," and "offensive, mischievous, and inexcusable exhibition." But Huxley's argument is today a commonplace of scientific knowledge, freely admitted by Deans and Bishops.

Huxley, indeed, saw nothing degrading in man's evolution from ape-like ancestors. In his Edinburgh lectures he said: "Thoughtful man, once escaped from the blinding influence

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\*Professor Mivart was later excommunicated by Rome, and on his deathbed refused to sign a profession of faith. Four years afterwards, through the efforts of zealous Catholic friends, he was restored to orthodoxy *post mortem*. They argued that Mivart was suffering from diabetes and so was probably not in his right mind when he wrote the scholarly articles in the *Nineteenth Century* which were condemned as heretical. Rome accepted the excuse, and the body was reburied in a Catholic cemetery.

of traditional prejudice, will find in the lowly stock whence Man has sprung, the best evidence of the splendor of his capacities; and will discern in his long progress through the past, a reasonable ground of faith in his attainment of a noble future."

In 1862, an extremely busy year, Huxley also assumed the full duties of the Hunterian professorship at the Royal College of Surgeons, which involved an immense amount of laborious dissection.

The substance of his Edinburgh lectures that year was embodied in the best known probably of all his books—*Man's Place in Nature*, which he completed before the end of the year and published in 1863. The book gives a clear exposition of the biological history of man, his relationships with other animals, particularly the anthropoid apes, and the peculiarly human characteristics that have set him off from them and that have given him his supremacy in the world.

"So far as cerebral structure goes," Huxley points out in this masterly work, "... it is clear that Man differs less from the Chimpanzee or the Orang [anthropoid apes] than these do even from the Monkeys, and that the difference between the brains of the Chimpanzee and of Man is almost insignificant, when compared with that between the Chimpanzee brain and that of the Lemur [lowest monkey]."

In fact, he continues, "whatever system of organs be studied, the comparison of their modifications in the ape series leads to one and the same result—that the structural differences



which separate Man from the Gorilla and the Chimpanzee are not so great as those which separate the Gorilla from the lower apes."

In conclusion, speaking of the vast difference between the civilization of the fourth century and that of the nineteenth, he says:

And what has made this difference? I answer fearlessly: The prodigious development of physical science within the last two centuries.

Modern civilization rests upon physical science; take away her gifts from our own country, and our position among the leading nations of the world is gone tomorrow; for it is physical science only, that makes intelligence and moral energy stronger than brute force.

The whole of modern thought is steeped in science; it has made its way into the works of our best poets, and even the mere man of letters, who affects to ignore and despise science, is unconsciously impregnated with her spirit and indebted for his best products to her methods. I believe that the greatest intellectual revolution mankind has yet seen is now slowly taking place by her agency. She is teaching the world that the ultimate court of appeal is observation and experiment, and not authority; she is teaching it to estimate the value of evidence; she is creating a firm and living faith in the existence of immutable moral and physical laws, perfect obedience to which is the highest possible aim of an intelligent being.

Elsewhere, referring to the great changes which marked the nineteenth century as compared even with the eighteenth, Huxley observed:

If we ask what is the deeper meaning of all these vast changes, I think there can be but one reply. They mean that reason has asserted and exercised her primacy over all provinces of hu-

man activity; that ecclesiastical authority has been relegated to its proper place; that the good of the governed has been finally recognized as the end of government, and the complete responsibility of governors to the people as its means, and that the dependence of natural phenomena in general on the laws of action of what we call matter has become an axiom.

Huxley made a personal investigation of spiritualism and psychic phenomena over a period of years. In 1874 he wrote a report on a spiritualistic séance which he had attended. He reached the conclusion that the whole business was an unmitigated imposture and fraud.

In the 1870's he prepared for the new edition of the *Encyclopedia Britannica* leading articles on a number of scientific subjects, including such topics of first importance as "The Animal Kingdom," "Biology," and "Evolution." These articles helped materially to spread the new scientific gospel.

It was as early as 1855 that Huxley delivered his first course of lectures to workingmen. These courses became immensely popular; so much so that many who were not workingmen adopted all sorts of camouflages in order to gain admittance. One man, who held a genteel office position, crashed the gate by describing himself as a "driver," discreetly refraining from mentioning the fact that all he ever drove was a quill. "He felt a strong interest in workingmen," says a contemporary, and was much beloved by them. On one occasion, having taken a cab home, on his arrival there, when he held out his fare to the cabman,

the latter replied, "Oh no, Professor, I have had too much pleasure and profit from hearing you lecture to take any money from your pocket—proud to have driven you, sir."

Two years later, in 1857, Huxley began giving courses of evening lectures on science. It was at about this time that he became examiner in physiology and comparative anatomy for the University of London.

In an address at the South London Workmen's College, in 1868, on "A Liberal Education, and Where to Find It," Huxley gave the following fine definition of a liberally educated man:

That man, I think, has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine, to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of Nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of Nature or of art, to hate all vileness, and to respect others as himself.

Such an one and no other, I conceive, has had a liberal education; for he is, as completely as a man can be, in harmony with Nature. He will make the best of her, and she of him. They will get on together rarely—she as his ever beneficent mother; he as her mouthpiece, her conscious self, her minister and interpreter.

Besides his lectures to workingmen, he addressed groups of schoolmasters, and fostered classes in physiology for women, and in elementary science for children. It was his interest in children that led him to become a member of the London School Board; his program for the little children was to "temper book-learning with something of the direct knowledge of Nature," to secure for them opportunities for physical training, and to give them a right understanding of social and moral law.

In those days the conservative idea was that it had "pleased God" to "call" the poor to their dreary "station in life," and that it was their duty to accept it without complaint and to serve and reverence those more fortunate than themselves. Huxley passionately believed that education "should be thrown open to all, that each man might know to what state of life" his own talents had called him. In the words of another contemporary, "He resented the idea that schools were to train either congregations for churches or hands for factories. He was on the Board as a friend of children. What he sought to do for the child was for the child's sake, that it might live a fuller, truer, worthier life."

He was especially anxious to see educational opportunities thrown open to women. In a letter to Sir Charles Lyell, March 17, 1860, he expressed his intention of giving his own daughters every advantage in this direction, and added: "If other people would do the like, the next generation would see women fit to be the companions of men in all their pur-

suits, though I don't think men have anything to fear from their competition." That these last words were probably meant humorously is suggested by another quotation: "The mind of the average girl is less different from that of the average boy, than the mind of one boy is from that of another; so that whatever argument justifies a given education for all boys, justifies its application to girls as well."

Huxley urged the necessity for technical education, and proposed continuation schools for children employed in industry.

It is hard for us today to realize that in Huxley's day many of the colleges and universities had no scientific staff, or at least none worthy of the name. He helped to bring about the establishment of a full-fledged faculty of science in every college and university. He was largely instrumental in reorganizing the University of London upon a modern basis. No less valuable was Huxley's service in assisting the government to establish a general system of State supported schools and in drawing up the curricula for them.

Huxley had a genius for educational organization, and his work in that direction alone would have won him the fame of a Charles W. Eliot or a William Rainey Harper if it had not been overshadowed by his stupendous achievements in science.

In those days Huxley conceived the idea, the importance of which is only now being fully realized, that exceptionally brilliant students should be discovered at an early age and given special opportunities for the development of

their talent. This search for genius among school children has, I understand, recently been started in California, and with excellent results.

"One knows people," said Huxley, "who are as heavy and stupid from undigested learning as others are from over-fulness of meat and drink. But a small percentage of the population is born with that most excellent quality, a desire for excellence, or with special aptitude of some sort or another. . . . Now, the most important object of all educational schemes is to catch these exceptional people, and to train them to count for the good of society. No man can say where they will crop up; like their opposites, the fools and the knaves, they appear sometimes in the palace, and sometimes in the hovel; but the great thing to be aimed at—I was almost going to say, the most important end of all social arrangements, is to keep these glorious 'sports' of Nature from being either corrupted by luxury or starved by poverty, and to put them into the position in which they can do the work for which they are especially fitted. . . . I weigh my words when I say that if the nation could purchase a potential Watt or Davy or Faraday, at the cost of a hundred thousand pounds down, he would be dirt cheap at the money."

One of the greatest of Huxley's public services was his organizing of the teaching of science in the common schools. It seems incredible to us today to discover that in the middle of the nineteenth century there was no scientific teaching at all in the secondary schools, practically no scientific books for



young students, and that the very idea of laboratory manuals was unknown.

But this is not so surprising when it is recalled that in those days there were, as we have already seen, no state-supported schools corresponding to a modern public school system. The sons of the well-to-do attended select private schools (misnamed public schools) like Eton, Harrow, Winchester and Rugby, and the few schools, such as there were, open to children of the common people were largely controlled by the Church, which, of course, was not interested in science. Girls were hardly educated at all, except by private tutors in the families of the wealthy.

"A large part of the prodigious mental activities of Huxley," it is said, "was devoted to compelling the world to take an interest in biological science. Had his life-work been no more than this side of it, it would have been of commanding importance."

Among other efforts to this end, he edited a series of *Science Primers*. He built up the science of biology from the bottom. Again, it is difficult for us to realize the general ignorance which prevailed, at a date within the lifetime of persons still living, on subjects which are today a part of the A B C of elementary education. "The body of man and the processes of life, in the earlier part of the century," it is said, "were almost as unknown to most people as were the structure of the earth and the great processes of nature. What was known of human anatomy and physiology was contained in ponderous treatises, written

in difficult and technical language suitable only for students of medicine and doctors. It was thought to be not only unnecessary but slightly coarse for those not in the profession to know anything of the viscera, of digestion, circulation, and so forth." To such lengths did Victorian prudery go that any knowledge of the human body was considered immodest. In the great Victorian conspiracy against Nature, even the mention of legs was taboo.

Such was the stone wall of prejudice and stupidity which Huxley had to batter down in order to enable the children of the coming generations to secure a sane and practical education. It was Huxley's aim not to present merely a lot of dry facts and figures about biology, for instance, but to make the study vital; not only to teach the facts, but to show their relation to other facts; not only to show the structures in an animal organism, but to explain how they came to be as they are.

His idea of culture he tersely expressed on one occasion as follows: "Perfect culture should supply a complete theory of life, based upon a clear knowledge alike of its possibilities and its limitations."

The aim of education, as he saw it, was to teach the individual how to "play the game,"—the great game of life.

"Suppose," he said, in one of his lectures, "it were perfectly certain that the life and fortune of every one of us would, one day or other, depend upon his winning or losing a game of chess. Don't you think that we should all consider it to be a primary duty to learn at least the names and the moves of the pieces;

to have a notion of a gambit, and a keen eye for all the means of giving and getting out of check? Do you not think that we should look with a disapprobation amounting to scorn, upon the father who allowed his son, or the state which allowed its members, to grow up without knowing a pawn from a knight?

"Yet it is a very plain and elementary truth, that the life, the fortune, and the happiness of every one of us, and, more or less, of those who are connected with us, do depend upon our knowing something of the rules of a game which has been played for untold ages, every man and woman of us being one of the two players in a game of his or her own. The chess-board is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of Nature. The player on the other side is hidden from us. We know that his play is always fair, just, and patient. But also we know, to our cost, that he never overlooks a mistake, or makes the smallest allowance for ignorance. To the man who plays well, the highest stakes are paid, with that sort of overflowing generosity with which the strong shows delight in strength. And one who plays ill is checkmated—without haste, but without remorse. . . .

"Well, what I mean by Education is learning the rules of this mighty game. In other words, education is the instruction of the intellect in the laws of Nature, under which name I include not merely things and their forces, but men and their ways; and the fashioning of the affections and of the will into an earnest and loving desire to move in harmony with those laws. For me, education means neither more nor less than this. Anything which professes to call itself education must be tried by this

standard, and if it fails to stand the test, I will not call it education, whatever may be the force of authority, or of numbers, upon the other side. . . .

"Nor should I speak of this process of education as past for anyone, be he as old as he may. For every man the world is as fresh as it was at the first day, and as full of untold novelties for him who has the eyes to see them. And Nature is still continuing her patient education of us in that great university, the universe, of which we are all members. . . .

"Those who take honors in Nature's university, who learn the laws which govern men and things and obey them, are the really great and successful men in this world. The great mass of mankind are the 'Poll.' who pick up just enough to get through without much discredit. Those who won't learn at all are plucked; and then you can't come up again. Nature's pluck means extermination.

"Thus the question of compulsory education is settled so far as Nature is concerned. Her bill on that question was framed and passed long ago. But, like all compulsory legislation, that of Nature is harsh and wasteful in its operation. Ignorance is visited as sharply as wilful disobedience—incapacity meets with the same punishment as crime. Nature's discipline is not even a word and a blow. It is left to you to find out why your ears are boxed.

"The object of what we commonly call education—that education in which man intervenes and which I shall distinguish as artificial education—is to make good these defects in Nature's methods; to prepare the child to receive Nature's education, neither incapably nor ignorantly, nor with wilful disobedience; and to understand the preliminary symptoms of

her pleasure, without waiting for the box on the ear. . . ."

Huxley pointed out that "the subjects of all knowledge are divisible into the two groups, matters of science and matters of art; for all things with which the reasoning faculty alone is occupied come under the province of science; and in the broadest sense, and not in the narrow and technical sense in which we are now accustomed to use the word art, all things feelable, all things which stir our emotions, come under the term of art, in the sense of the subject-matter of the aesthetic faculty." Hence, it seemed to him that "the business of education is, in the first place, to provide the young with the means and the habit of observation; and, secondly, to supply the subject-matter of knowledge either in the shape of science or of art, or of both combined."

Condensing into a sentence the goal of education, he said: "The whole object of education is, in the first place, to train the faculties of the young in such a manner as to give their possessors the best chance of being happy and useful in their generation; and, in the second place, to furnish them with the most important portions of that immense capitalized experience of the human race which we call knowledge of various kinds."

Although Huxley had no innate gift for public speaking and in his first efforts on the platform "had a firm conviction that he would break down every time he opened his mouth," he in time developed a remarkable mastery of this art. "Certain natural gifts aided him; his well-set figure and strong features, of which the piercing eyes and firm, trap-like mouth were the most striking, riveted attention, while

his voice had a wide range and was beautifully modulated."

But it was the substance of his talk and not the manner of delivery so much that drew the crowds to hear him and held them spellbound, while he, in turn, was absorbed in the successful "getting across" of scientific facts. He despised emotional appeals and other tricks of the platform performer. His was the art of the "convinced, positive, and logical thinker, who knew exactly what he meant you to know, and who set about telling it with the least possible concern for the words he used or for the sentences in which he formed his words."

It was perhaps as a popular lecturer that Huxley achieved his greatest contemporary celebrity and became best known to the public at large. He lectured before the most distinguished university audiences in England, Scotland, and America, but his favorite meetings were those composed of workmen. He did not talk down to these people. He addressed them on a democratic basis as equals, for he himself knew what hard work meant. There was never any element of the snob in Huxley; he was as much at home with the common people as was Lincoln. Professor Howes, writing from personal acquaintance with this phase of Huxley's work, remarks:

He gave workmen of his best. The substance of *Man's Place in Nature*, one of the most successful and popular of his writings, and of his *Crayfish*, perhaps the most perfect zoological treatise ever published, was first communicated to them. In one of the last communications I had with him, I asked his views as to the desirability of discontinuing the workmen's lectures at Jermyn Street, since the development of workmen's colleges and institutes was regarded by some as rendering their



continuance unnecessary. He replied, almost with indignation, "With our central situation and resources we ought to be in a position to give the workmen that which they cannot get elsewhere," adding that he would deeply deplore any such discontinuance.

Huxley's writings are models of clearness and simplicity. He is already an English classic; selections from his works are studied in American schools and colleges today as models of literature, without regard to their scientific content. Here again, Huxley had no innate gift; he became an artist in the written word through painful practice. A careful and conscientious writer, he illustrates in the products of his pen the truth of the dictum that "slow writing makes fast reading, and vice versa." "The fact is," he confessed, "that I have a great love and respect for my native tongue, and take great pains to use it properly. Sometimes I write essays half a dozen times before I can get them into proper shape; and I believe I become more fastidious as I grow older."

That every man of science after Huxley's time was expected to be a good speaker and writer was largely due to the example which Huxley himself set.

Huxley, however, had a natural gift for drawing. This was invaluable to him in his anatomical dissection work, in which drawings of the cross sections of the different organisms were necessary for class-room demonstration and as illustrations for his articles, laboratory manuals, and text-books. It is said that Huxley's lightning-like freehand drawings on the blackboard were the delight of his pupils and their despair when they tried to copy them.

Huxley was always a firm believer in the usefulness of drawing and repeatedly emphasized its importance in the curricula of the schools.

Physically, Huxley was of striking appearance. He was tall, of slender but athletic build, dark complexioned, with deep-set, dark, flashing eyes. He used to poke fun at the race purists of his day who, like our Nordic mythologists, imagined that all dark complexioned people were short, and that tallness and blondness went together. A tall, dark person was not supposed to exist; and in any event, a swarthy man, according to their theory, had no right to be such a superior specimen intellectually as was Huxley. It is interesting to recall that another great Englishman of pure Anglo-Saxon lineage had black eyes and dark hair—I refer to Thomas Paine. These two men did more for the cause of human freedom than any other two Englishmen in all history. It is up to the Nordic champions to explain the paradox if they can.

His friend, G. W. Smalley, gives us this vivid pen sketch of Huxley in his prime: "The square forehead, the square jaw, the tense lines of the mouth, the deep flashing dark eyes, the impression of something more than strength he gave you, an impression of sincerity, of solid force, of immovability, yet with the gentleness arising from the serene consciousness of his strength—all this belonged to Huxley and to him alone. The first glance magnetized his audience. The eyes were those of one accustomed to command, of one having authority, and not fearing on occasion to use it. . . . He was masculine in everything—look, gesture, speech. Sparing of gesture, sparing of emphasis, careless of mere rhetorical or oratorical art, he had nevertheless the secret of the high-

est art of all, whether in oratory or whatever else—he had simplicity.”

Professor Ray Lankester described Huxley's face as “grave, black-browed, and fiercely earnest.” His hair, which he wore rather long, was raven black in his youth and prime, but turned to a beautiful silvery white in age. Like so many other men of his day, he wore side-whiskers, which framed a pugnacious chin and a firm mouth. But the grim lips when in repose could relax into “a smile of almost feminine charm.”

He smoked incessantly while at work. His chief mental recreation he seems to have found in music; in his leisure hours the strains of a violin might be heard floating from his room. In his youth he used to go frequently to hear Sebastian Bach, the great composer, and he speaks of “the intense satisfaction and delight which I had in listening, by the hour together, to Bach's fugues.”

In his autobiographical sketch Huxley has given us some bits of self-analysis, attributing most of his inheritance to his mother. “Physically and mentally,” he says, “I am the son of my mother so completely—even down to peculiar movements of the hands, which made their appearance in me as I reached the age she had when I noticed them—that I can hardly find any trace of my father in myself, except an inborn faculty for drawing. . . . a hot temper, and that amount of tenacity of purpose which unfriendly observers sometimes call obstinacy.

“My mother was a slender brunette, of an emotional and energetic temperament, and possessed of the most piercing black eyes I ever saw in a woman's head. With no more education than other women of the middle classes

in her day, she had an excellent mental capacity. Her most distinguishing characteristic, however, was rapidity of thought. If one ventured to suggest she had not taken much time to arrive at any conclusion, she would say, 'I cannot help it; things flash across me.' That peculiarity has been passed on to me in full strength; it has often stood me in good stead; it has sometimes played me sad tricks; and it has always been a danger. But after all, if my time were to come over again, there is nothing I would less willingly part with than my inheritance of mother wit.

"In later years my mother, looking at me almost reproachfully, would sometimes say, 'Ah! you were such a pretty boy!' whence I had no difficulty in concluding that I had not fulfilled my early promise in the matter of looks . . ."

It appears that Herbert Spencer thought he saw in Huxley some of the ear-marks of a preacher. Huxley pooh-poohed this suggestion, and in an amusing anecdote of his childhood told of his nearest approach to a pulpit career:

I have a distinct recollection of certain curls of which I was vain, and of a conviction that I closely resembled that handsome, courtly gentleman, Sir Herbert Oakley, who was vicar of our parish, and who was as a god to us country folk, because he was occasionally visited by the then Prince George of Cambridge. I remember turning my pinafore wrong side forward in order to represent a surplice, and preaching to my mother's maids in the kitchen as nearly as possible in Sir Herbert's manner one Sunday morning when the rest of the family were at church.

Huxley's outstanding mental characteristics were absolute sincerity and straight-forwardness, extraordinary powers of criticism, generalization, and analysis, together with a pierc-

ing intuition—the gift which he ascribes particularly to his mother. He had a high temper, but it was under firm control. Few men have exhibited so great a tenacity of purpose; it enabled him to overcome obstacles that would have disheartened an ordinary man. He never weakened even at times when, as he himself expressed it, he was “hanging on by the eyelids,” hardly knowing perhaps where his next meal was coming from.

We have already noticed his artistic talent and his delight in music. In his spare time we find him reveling in the novels of George Sand. “She is bigger than George Eliot,” he commented, “more flexible, a more thorough artist.” Clearly he was no cold-blooded “materialist” so-called, or narrow-minded scientific specialist with vinegar instead of red blood in his veins.

One of the most striking features of his work was its infectious nature. “His vigorous and decided personality,” we are told, “was reflected on all the subjects to which he gave attention, and in the same fashion as his presence infected persons with a personal enthusiasm, so his writings stimulated readers to efforts along the same lines. His great influence is clear in the number and distinction of the biologists who came under his personal care, and in the great army of writers and thinkers who have been inspired by his views and methods on general questions.”

Huxley’s conscientiousness, thoroughness, and earnestness left an impress on all his work. His achievements in actual scientific discovery, great as they were, have been obscured by his more popular activities. Least recognized of all was his more pervasive, indirect influence upon scientific thinking and progress as a

whole; the world still lives largely in the scientific atmosphere created by Huxley.

In another brief paragraph he summed up the guiding principles in his life-work as follows:

To promote the increase of natural knowledge and to forward the application of scientific methods of investigation to all the problems of life to the best of my ability, in the conviction which has grown with my growth and strengthened with my strength, that there is no alleviation for the sufferings of mankind except veracity of thought and of action, and the resolute facing of the world as it is when the garment of make-believe by which pious hands have hidden its uglier features is stripped off.

It is with this intent that I have subordinated any reasonable or unreasonable ambition for scientific fame which I may have permitted myself to entertain, to other ends; to the popularization of science; to the development and organization of scientific education; to the endless series of battles and skirmishes over evolution; to the untiring opposition to that ecclesiastical spirit, that clericalism, which in England, as everywhere else, and to whatever denomination it may belong, is the deadly enemy of science.

Huxley's great passion was for the truth; he believed that insincerity and hypocrisy are the worst of all crimes, and that there can be no individual or national morality if falsehood is tolerated. He has been described as an apostle of clear thinking and common sense, "for thirty years the voice of Science crying in the wilderness of tradition and custom."

The personal generosity of the man, although he was never wealthy, is revealed by the story of a German scientific worker stranded in England, who applied to Huxley for help. Huxley, being unable to find him a job elsewhere, en-



gaged him to give lessons in German literature to the Huxley children, who already had a German governess.

That Huxley had a sense of humor is illustrated by another story. The Scotch, in those days as now, were proverbial for their thriftiness. Huxley lectured frequently at Edinburgh. In 1875 he conducted some summer classes there, and in a letter to Tyndall, commenting upon his operations in Scotland, he said: "My work at Edinburgh got itself done very satisfactorily, and I cleared about £1000 [some \$5000] by the transaction, being one of the few examples known of a Southern coming north and pillaging the Scots."

When the American Civil War had made the subject of freedom for the Negro a topic of controversy, Huxley was outspoken in his championship of emancipation. "No human being," he said, "can arbitrarily dominate over another without grievous damage to his own nature."

The amount of work which Huxley accomplished in his life was prodigious. Repeated attacks of ill-health were overcome by trips abroad; so that he lived out his three-score years and ten without a permanent breakdown.

After recounting some of his early failures, Huxley went on to point a moral: "I said to myself, 'Never mind; what's the next thing to be done?' I found that policy of 'never mind' and going on to the next thing to be done, to be the most important of all policies in the conduct of practical life. It does not matter how many tumbles you have in this life, so long as you do not get dirty when you tumble; it is only people who have to stop to be washed and made clean, who must necessarily lose the race. You learn that which is of inestimable impor-

tance—that there are a great many people in the world who are just as clever as you are. You learn to put your trust, by and by, in an economy and frugality of the exercise of your powers both moral and intellectual; and you very soon find out, if you have not found it out before, that patience and tenacity of purpose are worth more than twice their weight of cleverness.”

Huxley's domestic life, like that of Darwin, was ideal. Mrs. Huxley, who had proved her loyalty to him when he was young and “broke,” became his life-long companion. His children adored him, for he was a great playfellow with the youngsters. The nonsense letters, illustrated with comic drawings, which he wrote for them, show as tender an understanding of the child mind as Eugene Field's. A friend called Huxley's household “The Happy Family,” and advised acquaintances to visit it as an object lesson in domestic felicity.

In 1876, when Huxley visited America, he won the respect and admiration of audiences everywhere. And he did it not by flattery but by clear and straight expression of his mind. During the course of this visit he delivered the inaugural address at the opening of Johns Hopkins University in Baltimore. Here, as always, he spoke with characteristic frankness, and some of his words of warning are still worth pondering.

“It has been my fate,” he said, “to see great educational funds fossilize into mere bricks and mortar in the petrifying springs of architecture, with nothing left to work them. A great warrior is said to have made a desert and called it a peace. Trustees have sometimes made a palace and called it a university.” And with still greater directness and earnestness he went on to say; “I cannot say that I am

in the slightest degree impressed by your bigness or your material resources, as such. Size is not grandeur; territory does not make a nation. The great issue, about which hangs true sublimity, and the terror of overhanging fate, is, what are you going to do with all these things? . . .

"The one condition of success, your sole safeguard, is the moral worth and intellectual clearness of the individual citizen. Education cannot give these, but it can cherish them and bring them to the front in whatever station of society they are to be found, and the universities ought to be, and may be, the fortresses of the higher life of the nation."

When he went to Yale University during his visit to America, Professor Marsh, his guide, wanted to show him round the place to see the buildings. But Huxley brushed aside the suggestion. He was not interested in fine buildings. "Show me what you have got inside them," he said. "I can see plenty of bricks and mortar in my own country." His guide obliging, he immediately plunged into an examination of Professor Marsh's collection of American fossils and, on the basis of some new material which he there discovered, he proceeded, with Professor Marsh, to work out the evolutionary ancestry of the horse. Thus for the first time it was possible to show the actual stages in the development of an existing animal from a simpler form. This became one of the strongest links in the chain of evidence favoring evolution. It answered critics whose favorite argument was that no evidence could be shown of the evolution of any living animal. It was now *proved* that the horse, as we know the animal today, was never "created" à la Genesis.

Referring to his philosophical position, Huxley once employed this vivid analogy: "In fol-

lowing these lines of speculation I am reminded of the quarter-deck walks of my youth. In taking that form of exercise you may perambulate through all points of the compass with perfect safety, so long as you keep within certain limits: forget those limits, in your ardour, and mere smothering and spluttering, if not worse, await you. I stick by the deck and throw a life-buoy now and then to the struggling folk who have gone overboard; and all I get for my humanity is the abuse of all whenever they leave off abusing one another."

Huxley discovered that he was an Agnostic very early in life, but as the term did not then exist, he could not call himself one. He describes his state of mind thus:

When I reached intellectual maturity and began to ask myself whether I was an atheist, a theist, or a pantheist; a materialist or an idealist; a Christian or a freethinker, I found that the more I learned and reflected, the less ready was the answer; until, at last, I came to the conclusion that I had neither art nor part with any of these denominations, except the last. The one thing in which most of these good people here agreed was the one thing in which I differed from them. They were quite sure they had attained a certain "gnosis,"—had, more or less successfully, solved the problem of existence; while I was quite sure I had not, and had a pretty strong conviction that the problem was insoluble.

As a member of the famous Metaphysical Society, in London, Huxley came into contact with men bearing all sorts of labels. There, he says, he was "the man without a rag of a label to cover himself with," and he felt like "the historical fox when, after leaving the trap in which his tail remained, he presented himself to his normally elongated companions."

Speaking of how he was led to invent the term *Agnostic*, as a way out of his embarrass-

ing predicament, Huxley wrote in an equally humorous vein:

Tolerably early in life I discovered that one of the unpardonable sins, in the eyes of most people, is for a man to presume to go about unlabelled. The world regards such a person as the police do an unmuzzled dog, not under proper control. I could find no label that would suit me; so, in my desire to range myself and be respectable, I invented one; and as the chief thing I was sure of was that I did not know a great many things that the —ists and the —ites about me professed to be familiar with, I called myself an Agnostic. Surely no denomination could be more modest or more appropriate; and I cannot imagine why I should be every now and then haled out of my refuge and declared sometimes to be a Materialist, sometimes an Atheist, sometimes a Positivist; and sometimes, alas and alack, a cowardly or reactionary Obscurantist.

The word *Agnostic*, says Huxley elsewhere, "came into my head as suggestively antithetic to the 'gnostic' of Church history, who professed to know so much about the very things of which I was ignorant; and I took the earliest opportunity of parading it at our Society, to show that I, too, had a tail, like the other foxes. To my great satisfaction, the term took; and when the *Spectator* had stood godfather to it, any suspicion in the minds of respectable people, that a knowledge of its parentage might have awakened was, of course, completely lulled."

Huxley regarded Agnosticism as the militant enemy of the forces of superstition and bigotry. He declared that "as between Agnosticism and Ecclesiasticism, or, as our neighbors across the Channel call it, Clericalism, there can be neither peace nor truce. The Cleric asserts that it is morally wrong not to believe certain

propositions, whatever the results of a strict scientific investigation of the evidence of these propositions. He tells us 'that religious error is, in itself of an immoral nature.' [Newman] He declares that he has prejudiced certain conclusions, and looks upon those who show cause for arrest of judgment as emissaries of Satan. It necessarily follows that, for him, the attainment of faith, not the ascertainment of truth, is the highest aim of mental life. And, on careful analysis of the nature of this faith, it will too often be found to be, not the mystic process of unity with the Divine, understood by the religious enthusiast; but that which the candid simplicity of a Sunday scholar once defined it to be. 'Faith,' said this unconscious plagiarist of Tertullian, 'is the power of saying you believe things which are incredible.'

"Now I, and many other Agnostics, believe that faith, in this sense, is an abomination; and though we do not indulge in the luxury of self-righteousness so far as to call those who are not of our way of thinking hard names, we do feel that the disagreement between ourselves and those who hold this doctrine is even more moral than intellectual. It is desirable there should be an end of any mistakes on this topic. If our clerical opponents were clearly aware of the real state of the case, there would be an end of the curious delusion, which often appears between the lines of their writings, that those whom they are so fond of calling 'Infidels' are people who not only ought to be, but in their hearts are, ashamed of themselves. It would be discourteous to do more than hint the antipodal opposition of this pleasant dream of theirs to facts.

"The clerics and their lay allies commonly tell us that if we refuse to admit that there is



good ground for expressing definite convictions about certain topics, the bonds of human society will dissolve and mankind lapse into savagery. There are several answers to this assertion. One is that the bonds of human society were formed without the aid of their theology; and, in the opinion of not a few competent judges, have been weakened rather than strengthened by a good deal of it. Greek science, Greek art, the ethics of old Israel, the social organization of old Rome, contrived to come into being, without the help of anyone who believed in a single distinctive article of the simplest of the Christian creeds. The science, the art, the jurisprudence, the chief political and social theories, of the modern world have grown out of those of Greece and Rome—not by favor of, but in the teeth of, the fundamental teachings of early Christianity, to which science, art, and any serious occupation with the things of this world, were alike despicable.”

Pursuing the same line of thought, he said: “I verily believe that the great good which has been effected in the world by Christianity has been largely counteracted by the pestilent doctrine on which all the Churches have insisted, that honest disbelief in their more or less astonishing creeds is a moral offense, indeed a sin of the deepest dye, deserving and involving the same future retribution as murder and robbery. If we could only see, in one view, the torrents of hypocrisy and cruelty, the lies, the slaughter, the violations of every obligation of humanity, which have flowed from this source along the course of the history of Christian nations, our worst imaginations of Hell would pale beside the vision.”

He illustrated the stupidity of the bigot, who

shuts his eyes to plain facts, by recalling the lesson taught by old King Canute: "... to those whose life is spent, to use Newton's noble words, in picking up here a pebble and there a pebble on the shores of the great ocean of truth—who watch, day by day, the slow but sure advance of that mighty tide, bearing on its bosom the thousand treasures wherewith man ennobles and beautifies his life—it would be laughable, if it were not so sad, to see the little Canutes of the hour enthroned in solemn state, bidding that great wave to stay, and threatening to check its beneficent progress. The wave rises and they fly; but unlike the brave old Dane, they learn no lesson of humility: the throne is pitched at what seems a safe distance, and the folly is repeated."

For purely metaphysical abstractions Huxley had only contempt, as may be surmised from these words: "Cabanis may have made use of crude and misleading phraseology, when he said that the brain secretes thought as the liver secretes bile; but the conception which that much-abused phrase embodies is, nevertheless, far more consistent with fact than the popular notion that the mind is a metaphysical entity situated in the head, but as independent of the brain as a telegraph operator of his instrument."

Huxley believed not only in the permissibility but in the absolute duty of doubt in all matters where precise knowledge is not possible. In his mind the word *Agnosticism* "merely expressed the attitude which he assumed towards all problems on which he regarded the evidence as insufficient." It represented a definite habit of mind on all transcendental questions.

Speaking of "infallibility" in religion, he

said: "The truth is that the pretension to infallibility, by whomsoever made, has done endless mischief; with impartial malignity it has proved a curse, alike to those who have made it and those who have accepted it: and its most baneful shape is book infallibility. For sacerdotal corporations and schools of philosophy are able, under due compulsion of opinion, to retreat from positions that have become untenable; while the dead hand of a book sets and stiffens, amidst texts and formulae, until it becomes a mere petrefaction, fit only for that function of stumbling-block, which it so admirably performs. Wherever Bibliolatry has prevailed, bigotry and cruelty have accompanied it. It lies at the root of the deep-seated, sometimes disguised, but never absent, antagonism of all varieties of Ecclesiasticism to the freedom of thought and to the spirit of scientific investigation."

"Extinguished theologians," said Huxley, in a striking figure of speech, "lie about the cradle of every science as the strangled snakes besides that of Hercules; and history records that whenever science and orthodoxy have been fairly opposed, the latter has been forced to retire from the lists, bleeding and crushed, if not annihilated; scotched, if not slain. But orthodoxy is the Bourbon of the world of thought. It learns not, neither can it forget; and though, at present, bewildered and afraid to move, it is as willing as ever to insist that the first chapter of Genesis contains the beginning and the end of sound science; and to visit, with such petty thunderbolts as its half-paralyzed hands can hurl, those who refuse to degrade Nature to the level of primitive Judaism."

In a stinging indictment he nailed the charge

of conscious hypocrisy to the doors of the religious reactionaries:

The question whether the earth and the immediate progenitors of its present living population were made in six natural days or not is no longer one on which two opinions can be held. The fact that it did not come so into being stands upon as sound a basis as any fact of history whatever . . . . And when, Sunday after Sunday, men who profess to be our instructors in righteousness read out the statement, "In six days the Lord made heaven and earth, the sea, and all that in them is," in innumerable churches, they are either propagating what they may easily know, and therefore, are bound to know, to be falsities; or, if they use the words in some non-natural sense, they fall below the moral standards of the much abused Jesuit.

Huxley, in his defense of Evolution, was engaged in the greatest battle of all time against superstition and ignorance, for the intellectual freedom of all future generations. It was no easy task to rout the forces of Genesis from the field in which they were so deeply entrenched and had held unchallenged for centuries. As he himself remarked, many years later, in referring to those days: "At that time geologists and biologists could hardly follow to the end any path of inquiry without finding the way blocked by Noah and his ark, or by the first chapter of Genesis; and it was a serious matter, in this country at any rate, for a man to be suspected of doubting the literal truth of the diluvial [flood] or any other Pentateuchal [Old Testament] history."

He believed and boldly proclaimed that morality and religious beliefs have had a separate origin and had no connection until at a comparatively recent date "religion took morality under its protection," and he protested against

founding any system of ethics upon a false basis. Religion, he pointed out, is an attempt to reveal an unseen world, like the operations of the spiritualistic medium, while morality is merely the ethical code which man has evolved from his social experience.

That Huxley's contention was correct is admitted in a recent statement from the pen of the Rev. James M. Gillis, the eminent Paulist Father and editor of the *Catholic World*, who writes:

Furthermore (though it may savor of scandal to admit it), religion can exist without morality. I speak of a *de facto* condition, not of an ideal. Religion frequently exists, and even flourishes exuberantly, side by side with an atrophied morality. Religion can survive even when conscience is dead. Our religion and morality are not only not identical. They need not even be coincident.

Evolution, of course, relegates to the realm of mythology the story of "the fall of man," on which the doctrine of "original sin" is based. "That the doctrine of evolution implies a former state of innocence of mankind," says Huxley, "is quite true; but as I have remarked, it is the innocence of the ape and the tiger, whose acts, however they may run counter to the principles of morality, it would be absurd to blame. The lust of the one and the ferocity of the other are as much provided for in their organization, are as clear evidences of design, as any other features that can be named."

Hence, morality has nothing to fear from the collapse of superstition: "The causes which have led to the development of morality in mankind, which have guided or impelled us all the way from the savage to the civilized state, will not cease to operate because a number of

ecclesiastical hypotheses turn out to be baseless . . . . 'Beloved brethren, that we may be spotlessly moral, before all things let us lie,' is the sum total of many an exhortation addressed to the 'Infidel.' Now, as I have already pointed out, we cannot oblige our exhorters."

Huxley believed that scientific knowledge would provide the basis for a natural ethics. "I say that natural knowledge, seeking to satisfy natural wants, has found the ideas which can alone still spiritual cravings. I say that natural knowledge, in desiring to ascertain the laws of comfort, has been driven to discover those of conduct, and to lay the foundation of a new morality."

While Huxley keenly realized the existence of evil in the world and the tragic suffering which prevails so widely in untamed Nature, he held that human society could and should work out an ethical process which might be superimposed upon the cosmic process, and that in this ethical process, justice, mercy, love and unselfishness would find a place. The revolutionary changes in Nature which have been wrought by material civilization should make possible no less revolutionary changes in human relations. "When physiology, psychology, ethics, and political science," he said, "now befogged by crude anticipations and futile analogies, have emerged from their childhood, they may work as much change on human affairs as the earlier-ripened physical sciences wrought on material progress."

"The highest conceivable form of human society," it seemed to Huxley, "is that in which the desire to do what is best for the whole dominates and limits the action of every member of that society. The more complex the social organization, the greater the number of



acts from which each man must abstain, if he desires to do that which is best for all. Thus the progressive evolution of society means increasing restriction of individual freedom in certain directions.

"With the advance of civilization, and the growth of cities and of nations by the coalescence of families and of tribes, the rules which constitute the common foundation of morality and of law became more numerous and complicated, and the temptations to break or evade many of them stronger. In the absence of a clear apprehension of the natural sanctions of these rules, a supernatural sanction was assumed; and imagination supplied the motives which reason was supposed to be incompetent to furnish. Religion, at first independent of morality, gradually took morality under its protection; and the supernaturalists have ever since tried to persuade mankind that the existence of ethics is bound up with that of supernaturalism."

Huxley's broad and generous social gospel, and his condemnation of social injustice, are feelingly expressed in the following remarkable passage:

Even the best of modern civilizations appears to me to exhibit a condition of mankind which neither embodies any worthy ideal nor even possesses the merit of stability. I do not hesitate to express my opinion that, if there is no hope of a large improvement of the condition of the greater part of the human family; if it is true that the increase of knowledge, the winning of a greater dominion over Nature which is its consequence, and the wealth which follows upon that dominion, are to make no difference in the extent and the intensity of want, with its concomitant physical and moral degradation, among the masses of the people, I should hail the advent of some kindly comet, which would sweep the whole affair away, as a desirable

consummation. What profits it to the human Prometheus that he has stolen the fire of heaven to be his servant, and that the spirits of the earth and of the air obey him, if the vulture of pauperism is eternally to tear his very vitals and keep him on the brink of destruction? . . . . To those who think that questions of the kind have merely an academic interest, let me suggest once more that a century ago Robespierre and St. Just proved that the way of answering them may have extremely practical consequences.

Huxley made important contributions to political science in a number of essays which will be found in his collected works. Space limitations prevent an analysis of his political theories here. I have discussed Huxley's ideas as a political thinker in an article entitled "A Biological Interpretation of Politics," published in the *Open Court* for May, 1923, available in the periodical files of the leading libraries .

A widely read philosopher, a profound student especially of Descartes, Huxley was at home with all the great thinkers of mankind, from Aristotle to Kant and Schopenhauer. He wrote a book that is considered the best short work in existence on Hume.

What is the scientific attitude? Huxley summed it up in a few words when he wrote: "Men of science do not pledge themselves to creeds; they are bound by articles of no sort; there is not a single belief that it is not a bounden duty with them to hold with a light hand and to part with cheerfully, the moment it is really proved to be contrary to any fact, great or small. And if, in course of time, I see good reasons for such a proceeding, I shall have no hesitation in coming before you, and pointing out any change in my opinion without finding the slightest occasion to blush for so doing."

Huxley believed that man should concentrate his energies upon making the most out of this life and in making the world a better place in which to live, for ourselves and for those who are to come after. On the question of immortality he had no illusions. He wrote:

I cannot conceive of my personality as a thing apart from the phenomena of my life . . . . Nor does the infinite difference between myself and the animals alter the case. I do not know whether the animals persist after they disappear or not. I do not even know whether the infinite difference between us and them may not be compensated by *their* persistence and *my* cessation after apparent death, just as the humble bulb of an annual lives, while the glorious flowers it has put forth die away . . . . Nor does it help me to tell me that the aspirations of mankind—that my own highest aspirations even—lead me towards the doctrine of immortality. I doubt the fact, to begin with, but if it be so even, what is this but in grand words asking me to believe a thing because I like it? Science has taught me the opposite lesson. She warns me to be careful how I adopt a view which jumps with my preconceptions, and to require stronger evidence for such belief than for one to which I was previously hostile. My business is to teach my aspirations to conform themselves to facts, not to try to make facts harmonize with my aspirations.

Speaking of the death of his first-born child, a beautiful boy of four years, who was swept away by scarlet fever in forty-eight hours, Huxley remarked with deep emotion:

As I stood beside the coffin of my little son the other day, with my mind bent on anything but disputation, the officiating minister read, as a part of his duty, the words, "If the dead rise not again, let us eat and drink, for tomorrow we die." I cannot tell you how inexpressibly they shocked me. Paul had neither wife nor child, but he **must**

have known that his alternative involved a blasphemy against all that was best and noblest in human nature. I could have laughed with scorn. What! because I am face to face with irreparable loss, because I have given back to the source from whence it came, the cause of a great happiness, still retaining through all my life the blessings which have sprung and will spring from that cause, I am to renounce my manhood, and, howling, grovel in bestiality? Why, the very apes know better, and if you shoot their young, the poor brutes grieve their grief out and do not immediately seek distraction in a gorge.

The number of high offices which Huxley held during his later years was extraordinary. As we have seen, he was a member of the London School board; he was Government Inspector of Fisheries, a member of numerous important royal commissions, and Lord Rector of several universities; he was President of the Geological Society, President of the British Association (1870), and last and greatest, President of the Royal Society.

Huxley's election to the presidency of the Royal Society in 1883 placed him in the most distinguished scientific position in the world. This famous Society was established in the seventeenth century, and has numbered many illustrious names in its list of members and officers. The presidency was by no means a merely honorary position for Huxley. "The duties of the office," he wrote Sir Joseph Hooker, "are manifold and heavy; they include attendance at all the meetings of the Fellows, and of the councils, committees, and sub-committees of the Society, and especially the supervision of the printing and illustrating of papers on biological subjects that are published in the Society's Transactions and Proceedings; the latter often involving a protracted correspondence

with the authors. To this must be added a share in the supervision of the staff officers, of the library and correspondence, and the details of house-keeping."

Huxley received an honorary degree of D.C.L. from ancient Oxford. He was offered a professorship there twice, as well as the mastership of University College.

The regard and affection of his friends was demonstrated in an unusual way in 1872 when, on the occasion of a serious breakdown, Huxley was enabled to go abroad for a period of rest and recuperation by eighteen friends, Darwin heading the list, who in a tactful manner deposited 2000 guineas to Huxley's credit at his bank.

In 1885 and 1886 Huxley crossed swords with the redoubtable Gladstone in a series of articles on Science and the Bible in the *Nineteenth Century*, and made the antiquated theology of the "Grand Old Man" of English politics look decidedly ridiculous. This was practically the last gasp of Genesis in England.

By 1887 the battle for Evolution had been so completely won that even the Bishops were speaking of science "not only with knowledge, but in the spirit of equity and generosity." Commenting upon the change that had come about, so largely the result of his own efforts, Huxley wrote:

How often was it my fate, a quarter of a century ago, to see the whole artillery of the pulpit brought to bear upon the doctrine of evolution and its supporters! Anyone unaccustomed to the amenities of ecclesiastical controversy would have thought that we were too wicked to be permitted to live.

In a series of articles written for the same periodical in 1889, Huxley presented a masterly exposition of the modern point of view. In his

first article, entitled "Agnosticism," he said in part:

Agnosticism, in fact, is not a creed, but a method, the essence of which lies in the rigorous application of a single principle. That principle is of great antiquity; it is as old as Socrates . . . . Positively, the principle may be expressed: in matters of the intellect, follow your reason as far as it will take you, without any regard to any other consideration. And negatively: in matters of the intellect do not pretend that conclusions are certain which are not demonstrated or demonstrable. That I take to be the agnostic faith, which if a man keep whole and undefiled, he shall not be ashamed to look the universe in the face, whatever the future may have in store for him.

In one of his last pieces of writing, Huxley gave a humorous account of how he had, much against his will, been brought into conflict with the Bible:

I had set out on a journey, with no other purpose than that of exploring a certain province of natural knowledge; I strayed no hair's breadth from the course which it was my right and my duty to pursue; and yet I found that, whatever route I took, before long I came to a tall and formidable-looking fence. Confident as I might be in the existence of an ancient and indefeasible right-of-way, before me stood the thorny barrier with its comminatory notice-board—"No thoroughfare. By order. Moses." There seemed no way over; nor did the prospect of creeping round, as I saw some do, attract me . . . . The only alternatives were either to give up my journey—which I was not minded to do—or to break the fence down and go through it.

Taking matters into his own hands, he boldly broke down the fence with his axe and cleared a passage through which he and thousands of travelers after him have safely passed.



The highway is open now, but the minions of Moses, hiding in the bushes, are still looking for a chance to repair the broken fence.

The government of England, in spite of Huxley's championship of Agnosticism, conferred upon him, not long before his death, an extraordinary recognition of his public services. The Prime Minister, Lord Salisbury, appointed him a Privy Councillor.

Looking back over his long life of strenuous effort, Huxley said:

But if I may speak of the objects I have had more or less definitely in view since I began the ascent of my hillock, they are briefly these: To promote the increase of natural knowledge and to forward the application of scientific methods of investigation to all the problems of life to the best of my ability, in the conviction which has grown with my growth and strengthened with my strength, that there is no alleviation for the sufferings of mankind except veracity of thought and of action, and the resolute facing of the world as it is when the garment of make-believe by which pious hands have hidden its uglier features is stripped off.

It is with this intent that I have subordinated any reasonable, or unreasonable, ambition for scientific fame which I may have permitted myself to entertain to other ends; to the popularization of science; to the development and organization of scientific education; to the endless series of battles and skirmishes over evolution; and to untiring opposition to that ecclesiastical spirit, that clericalism, which in England, as everywhere else, and to whatever denomination it may belong, is the deadly enemy of science.

Perhaps the best epitaph for Huxley will be found in these characteristic words, which were among his last utterances:

If I am to be remembered at all, I would rather

it should be as a man who did his best to help the people than by any other title.

Only three days before his death, he wrote to Hooker that he was far from feeling like "sending in his checks," and that he was looking forward to recovery.

Active almost to the very end, Huxley succumbed to a complication of diseases on June 29, 1895, aged seventy years, and his funeral was held on America's Independence Day, July 4. All England mourned his passing, and scientists throughout the world paid tribute to the memory of their lost leader. Even his sincere opponents recognized in him a gallant gentleman, "without fear and without reproach."

